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The long-term goal of this project is to provide a current measurement package that 1) is integratable into a glider 2) provides higher resolution current data than the surface and depth averaged measurements the glider currently derives from the GPS fixes it obtains during surfacings and 3) provides the data in near real-time.

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Integration of a Teledyne RDI Acoustic Doppler Current Profiler into a Slocum Glider

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LONG-TERM GOALS

The long-term goal of this project is to provide a current measurement package that 1) is integratable into a glider 2) provides higher resolution current data than the surface and depth averaged measurements the glider currently derives from the GPS fixes it obtains during surfacings and 3) provides the data in near real-time.

OBJECTIVES

The objectives of this work are to perform the required hardware and software integration of a Teledyne RD Instruments downward looking 600kHz ADCP into a Slocum 200m Electric Glider, test the new configuration by flying the glider in different aquatic environments, use the test results to refine and optimize the sampling scheme of the sensor package and develop software to graphically display the data. Additionally, the knowledge gained from this integration will allow for the smooth integration of the deep version into 1000m Slocum Electric Gliders.

APPROACH

The ADCP to be integrated into the Glider, Figure 1, is a 600 kHz, 4 beam, Janus Piston Transducer, made of aluminum and rated to a depth of 300m. Weight of the ADCP components in air is approximately 2kg. The ADCP head will be mounted into a Slocum glider science bay taking into account the 26^0 nominal dive angle of the glider. The system will be capable of both water profiling and bottom tracking. Software will be designed on the glider side that will allow current data to be collected during a full dive cycle while being conservative with power.

Raw data collected by the ADCP will be stored on the science bay Persistor flashcard for download at recovery. Processed snippets of the data will be sent back by the glider to the command center at each surfacing.

Initial testing of the Glider/ADCP system will be done in a contained area. Open-ocean, end-to-end testing will then be done in parallel with other projects already funded by ONR

In order to accomplish the objectives of the project, the following key tasks will be conducted:

Task 1: Design the integration of the ADCP into the Glider.

Task 2: Purchase the ADCP and have the science bay pressure housing that will hold the ADCP machined.

Task 3: Integrate the ADCP hardware into the glider science bay.

Task 4: Integrate the ADCP into the Glider Software.

Task 5: End-to-End Testing of the Integrated Glider/ADCP System.

WORK COMPLETED

The contract money has not yet been distributed. As such, no work has been undertaken.

RESULTS

The contract money has not yet been distributed. As such, no work has been undertaken so there are no results to report.

IMPACT/APPLICATIONS

Gliders provide a tool to gather data over long time periods, sometimes in difficult to access areas and during times when it is not safe or possible (storms) for scientists to collect data by normal shipboard means. They also provide the data to the researchers in near real-time. The addition of ADCPs to the suite of sensors that can be integrated into gliders expands the data collection capabilities of the gliders and gives scientists another piece to the puzzle of understanding ocean circulation.

There are a number of presently funded ONR projects that would benefit from ADCP data. Among them are the Passive Acoustic Autonomous Marine Mammal Monitoring Program and Persistent Littoral Undersea Surveillance – Innovative Naval Prototype (PLUS-INP). Additionally the Naval Oceanographic Office (NAVOCEANO) would benefit from having gliders with integrated ADCP systems. Several examples of where current information would have been helpful to them are SHAREM150 and RIMPAC06 .

RELATED PROJECTS

None.

TRANSITIONS

An integrated glider/ADCP system will be a valuable addition to the present suite of sensors integrated into gliders. This latest addition could be transitioned to the LBSG glider acquisition, to the glider group at the Naval Oceanographic Office as well as to the non-military users .